

Claims

What is Claimed is:

1. A method of forming a coating on a stent, comprising:

applying a coating formulation to a stent, the coating formulation includes a first

5 ingredient and a second ingredient; and

modifying the ratio of the first ingredient with respect to the second ingredient in the coating formulation as the coating formulation is being applied to the stent.

2. The method of Claim 1, wherein the act of applying comprises spraying the coating formulation on the stent.

10 3. A stent comprising a coating produced in accordance with the method of Claim 1, wherein the coating has a first region and a second region wherein the quantity of the first ingredient with respect to the second ingredient is different in the first region as compared to the second region.

15 4. The method of Claim 1, wherein the first ingredient is a polymeric material and the second ingredient is a therapeutic substance.

5. The method of Claim 4, wherein the polymeric material is selected from the group consisting of ethylene vinyl alcohol copolymer, polybutylmethacrylate, polyethylene glycol, amorphous Teflon, and poly(ethylene-co-vinyl acetate).

20 6. The method of Claim 4, wherein the therapeutic substance is selected from the group consisting of actinomycin D, paclitaxel, docetaxel, rapamycin, β -estradiol and BAK Heparin.

7. The method of Claim 1, wherein the first ingredient is a first polymeric material and the second ingredient is a second polymeric material.

25 8. The method of Claim 1, wherein the ratio is modified by gradually increasing the concentration of the first ingredient in the coating formulation from the initiation of the

application of the coating formulation to the stent until the termination of the application of the coating formulation to the stent.

9. A system for applying a coating on a stent, comprising:

a nozzle for spraying a composition onto a stent;

5 a first reservoir in fluid communication with the nozzle for supplying a first ingredient of the composition to the nozzle;

a second reservoir in fluid communication with the nozzle for supplying a second ingredient of the composition to the nozzle; and

10 a control assembly for adjusting the amount of the first or second ingredient that is fed into the nozzle wherein the amount of the first and second ingredient that is sprayed by the nozzle can be modified by the control assembly without interrupting the application of the composition onto the stent.

10. The system of Claim 9, further comprising a mixer for mixing the first ingredient with the second ingredient.

15 11. The system of Claim 9, wherein the first ingredient is a polymeric material and the second ingredient is a therapeutic substance.

12. The system of Claim 9, wherein the first ingredient is a first polymeric material and the second ingredient is a second polymeric material.

20 13. The system of Claim 9, wherein the control assembly includes a valve for adjusting the input rate of the first or second ingredient to the nozzle.

14. An implantable medical device comprising a coating having a first ingredient and a second ingredient, wherein from a deep region of the coating to a more shallow region of the coating, the ratio of the concentration of the first ingredient to the concentration of the second ingredient gradually increases or decreases.

15. The implantable medical device of Claim 14, wherein the first ingredient is a polymeric material and the second ingredient is a therapeutic substance.

16. The implantable device of Claim 15, wherein the polymeric material is selected from the group consisting of ethylene vinyl alcohol copolymer, polybutylmethacrylate, polyethylene glycol, amorphous Teflon, and poly(ethylene-co-vinyl acetate).

17. The implantable device of Claim 15, wherein the therapeutic substance is selected from the group consisting of actinomycin D, paclitaxel, docetaxel, rapamycin, β -estradiol and BAK Heparin.

18. The implantable medical device of Claim 14, wherein the first ingredient is a first polymeric material and the second ingredient is a second polymeric material.